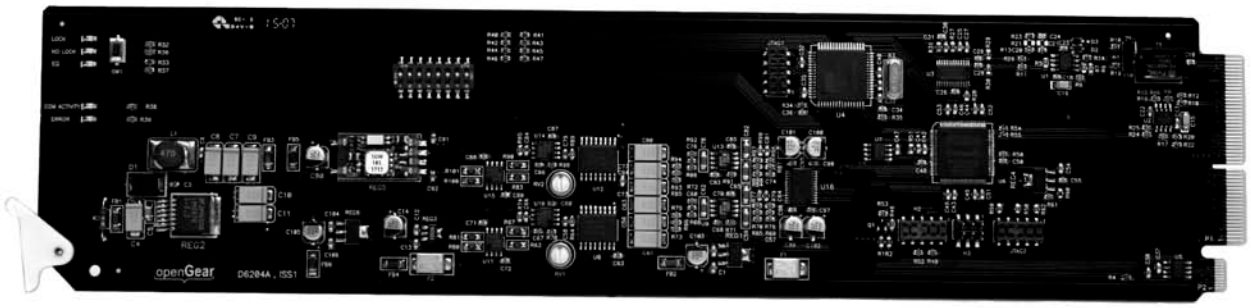
Sierra Video Systems

DAC-162

AES/EBU Digital to Analog Audio Converter – 75 Ohm

Owner's Manual



Sierra Video Part Number: DAC-162
Version: 1.1

DAC-162 • AES/EBU Digital to Analog Audio Converter 75 Ohm User Manual

- Sierra Video Part Number: **DAC-162**
- Document Version: 1.1
- Printed in the United States.

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- sierravideo is a registered trademark of Sierra Video Systems.
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Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “Important Safety Instructions” listed below so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these Specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning

The symbol with the word **“Warning”** within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

Caution

The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Notice

The symbol with the word “**Notice**” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.

ESD Susceptibility

This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions

Caution

This product is intended to be a component product of the openGear 8000 series frame. Refer to the openGear 8000 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as it’s component products.

Warning

Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.

Warning

Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product’s power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Notice

Changes or modifications to this equipment not expressly approved by Sierra Video Systems could void the user's authority to operate this equipment.

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numerique de classe "A" est conforme à la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.

Notice

This is a Class A product. In domestic environments this product may cause radio interference in which case the user may have to take adequate measures.

Maintenance/User Serviceable Parts

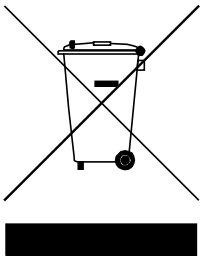
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Sierra Video Systems encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

Introduction

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- Features
- Documentation Terms

Overview

The **DAC-162 is an AES/EBU digital to analog audio converter** designed for broadcast use. It provides digital to analog audio conversion along with AES/EBU signal distribution.

The DAC-162 supports audio sampling frequencies from 30kHz to 192 kHz. It converts the incoming AES/EBU digital audio signal to a stereo analog audio signal using 24 bit conversion technology.

Cable equalization and reclocking techniques enable the DAC-162 to recover the incoming digital audio signal reliably.

The DAC-162 is designed for use in the openGear 8310-C series frames.

Functional Block Diagram

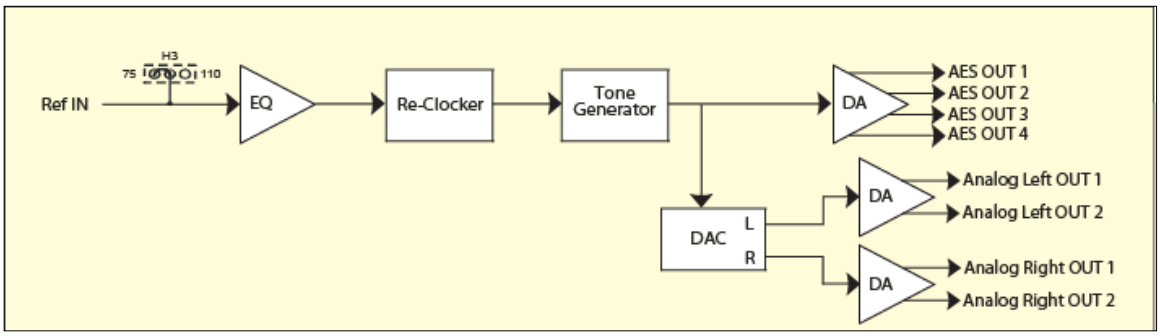


Figure 1. Simplified Block Diagram of the DAC-162 Functions

Features

The following features make the DAC-162 the best solution for digital to analog audio conversion.

- Converts AES/EBU digital to analog audio while providing AES/EBU signal distribution
- Cable equalization and data reclocking on the incoming AES/EBU signal
- 24 bit technology provides the highest quality signal conversion
- Supports audio sampling frequencies from 30kHz to 192 kHz
- 5 year warranty
- Fits openGear 8310-C series frames

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the **8310-C** frame that houses the **DAC-162** card.
- "**Operator**" and "**User**" refer to the person who uses the **DAC-162**.
- "**Board**", and "**Card**" refer to the **DAC-162** card itself, including all components and switches.

Installation and Setup

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Rear Module Options
- Board Installation

Static Discharge

Whenever handling the DAC-162 and other related equipment, please observe all static discharge precautions as described in the following note:

ESD Susceptibility

Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Unpacking

Unpack each DAC-162 you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Sierra Video Systems directly.

Rear Module Installation

If you are installing the card into a slot with no rear module, you should have ordered and received one of the DAC-162-B module. You will need to install it in your 8310 frame before you can connect cables.

Use the following steps to install a rear module in an 8310 openGear™ frame:

1. Refer to the openGear™ 8310 frame Owner's Manual, to ensure that the frame is properly installed according to instructions.
2. On the rear of the 8310, locate the card frame slot.
3. As shown in Figure 2, seat the bottom of the rear module in the seating slot at the base of the frame's back plane.

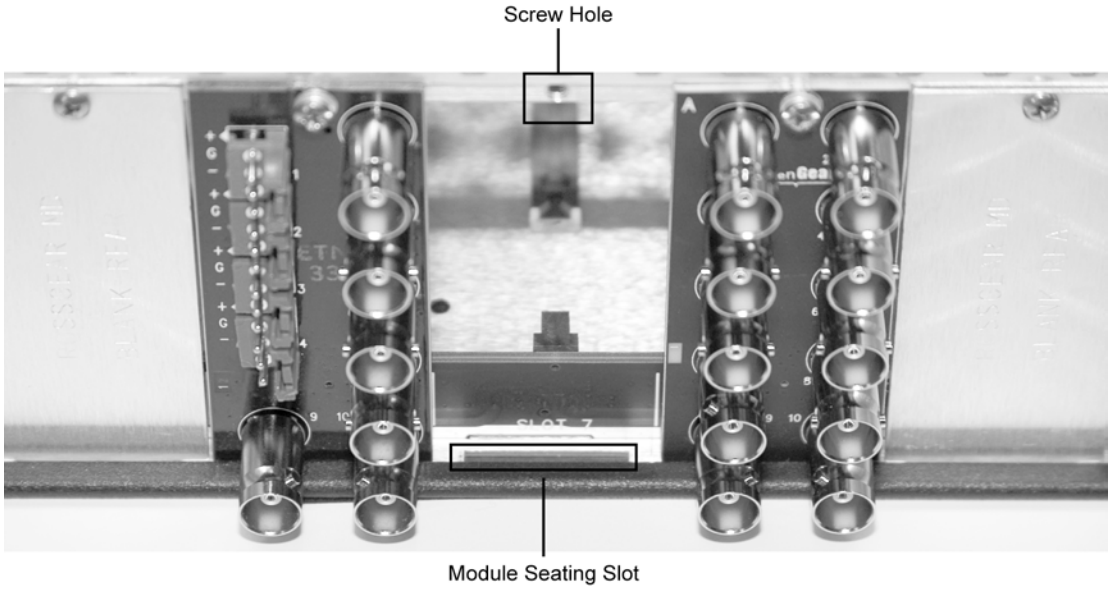


Figure 2. Rear Module Installation

4. Align the top hole of the DAC-162-B with the screw hole on the top edge of the 8310 back plane.
5. Using a Phillips driver and the supplied screw, fasten the rear module to the 8310 back plane. Do not over tighten.

All modules are installed using the same method above.

The following section contains a drawing of the DAC-162-B module.

Rear Module Options

This is a drawing of the DAC-162-B rear module to be used in the **10 slot 8310-C frame** only.

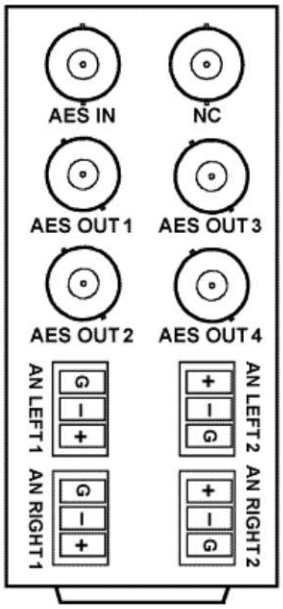


Figure 2. Rear Module

User Controls

This chapter contains a description of the DAC-162 user controls:

- EQ Switch
- LEDs
- DIP Switch Settings

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User Controls

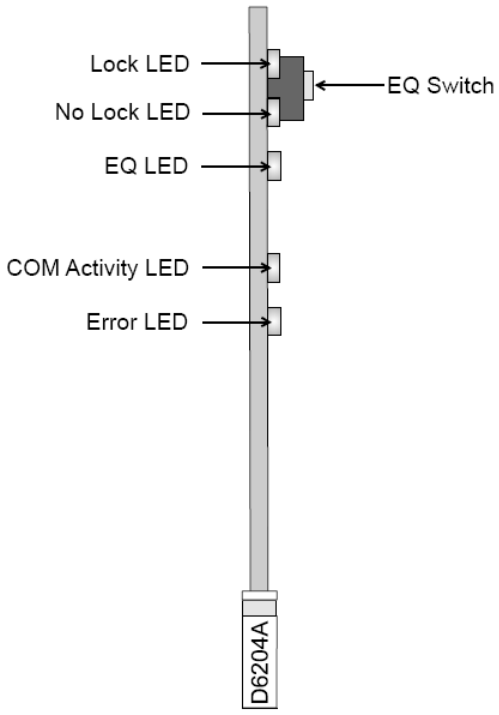

Figure 3. Card-edge User Controls

EQ Switch — SW1

The **EQ Switch** (**SW1)** is used to insert the cable equalizer into the incoming AES/EBU signal. The DAC-162 can recover digital audio signals conforming to AES/EBU specifications and transmitted over 75ohm, coaxial cable, up to 600 metres (2000 ft) long without equalization. For cable lengths in excess of 600 metres, we recommend that the input equalization be activated. Note that switching the EQ in and out can cause audible artefacts.

- Pressing the EQ Switch SW1 will activate the yellow EQ LED to indicate this feature is activated.
- While the EQ Switch SW1 is activated pressing it again will disable the EQ and the yellow EQ LED will go off.

LEDs

The front-edge of the card features LEDs that display the status of the input signals.

As selections are made in the menus, (refer the subsequent chapter for complete menu descriptions), the LEDs display the status of the input signals. Descriptions are provided in the following table:

LED	Color	Location	Display and Description
Lock	Green	Top of the card	When on there is a valid AES/EBU signal at the input.
No Lock	Red	Second from the top	When on a valid AES/EBU signal is not present
EQ	Yellow	Third from the top	When on this indicates that the cable EQ has been inserted by pressing SW1 or that feature has been enabled through Dashboard.
Com Activity	Green	Fourth from the top	When on this indicates that the DAC-162 is communicating to Dashboard through the CAN bus.
Error	Red	Fifth from the top	When on this indicates that there is an error in the communications to Dashboard through the CAN bus.

Table 1. Status LED Descriptions

DIP switch settings

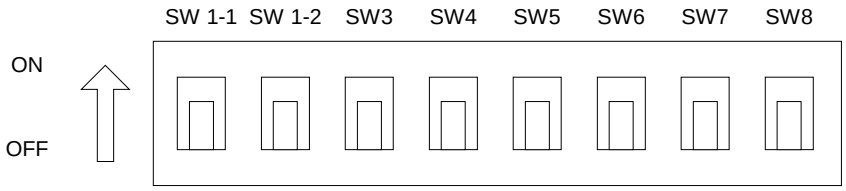

Figure 4. DIP Switch

Table 1 Analog Output Level

	SW 1-1	SW 1-2	
1	ON	ON	Mute
2	ON	OFF	-12dBFS/+4dBu
3	OFF	ON	-18dBFS/+4dBu
4	OFF	OFF	-20dBFS/+4dBu

SW3 Tone Generator

'ON' – Generates -20dBFS line up tone. This feature requires an input signal for reference. The tone is 1Khz when input sample rate is 48K, 2KHz at 96K and 4KHz at 192 K.

'OFF' – Normal operation.

SW7 Default (power up default parameter settings)

'ON' – Get card parameters from non volatile memory, ignore dip switch settings. (Configurable with Dashboard Control system)

'OFF' – Get card parameters from the Dip switch.

SW8 Dashboard Enable

'ON' – Only card status is available on Dashboard, users are prevented from changing parameters.

'OFF' – Normal operation, users have full access to the cards parameters.

Specifications

Technical Specifications

DIGITAL INPUT

Resolution	24 Bit
Input Level	0.2-7 Vp-p
Input Impedance (transformer balanced)	75Ω,110 Ω, HiZ
Sampling Frequency Range	30 kHz to 192 kHz

DIGITAL OUTPUT

Resolution	24 Bit
Output Level	1 V p-p nominal
Output Impedance	75Ω unbalanced
Sampling Frequency Range	30 kHz to 192 kHz
Jitter	Less than 5 ns

ANALOG (fs=48 kHz, 0 dBFS = +24 dBu)

Maximum Output Level	+24 dBu
Frequency Response	+/-0.2 dB, 20 Hz to 20 kHz
Noise(un-weighted)	84 dBu ,20 Hz to 20 kHz
THD+N	< 0.01%
Stereo Separation	100 dB, 20 Hz to 20 kHz
Output Impedance	60Ω Balanced

GENERAL

Power Requirements	+12 V,4Watts, MAX
Dimensions	3.025" high x 12.800" deep
Weight	approx.0.115 kg (0.252 lbs)

Sierra Video Systems reserves the right to change performance specifications without prior notice.

Warranty and Service Information

Warranty and Repair Policy

The openGear DAC-162 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your openGear DAC-162 proves to be defective in any way during this warranty period, Sierra Video Systems reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this openGear DAC-162 has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Sierra Video Systems be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This openGear DAC-162 User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Sierra Video policy dictates that all repairs to the openGear DAC-162 are to be conducted only by an authorized Sierra Video factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Sierra Video factory representative, will automatically void the warranty. Please contact Sierra Video Technical Support for more information.

In Case of Problems

Should any problem arise with your openGear DAC-162, please contact the Sierra Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your openGear DAC-162. If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Sierra Video Systems will be shipped collect.

The Sierra Video Technical Support Department will continue to provide advice on any product manufactured by Sierra Video, beyond the warranty period without charge, for the life of the equipment.

Ordering Information

Standard Equipment

- **DAC-162** AES/EBU Digital to Analog Audio Converter 75 Ohm

Optional Equipment

- **DAC-162OM** AES/EBU Digital to Analog Audio Converter 75 Ohm Owner's Manual (additional Owner's Manual)

- **DAC-162-B Single Card Rear Module** (6 BNC, 4 Phoenix Connector Rear Module)

Your **DAC-162** Digital to Analog Audio Converter is a part of the openGear family of products. Sierra Video offers a full line of openGear terminal equipment including distribution, conversion, monitoring, muxing, demuxing and processing of AES/EBU and HD/SD-SDI as well as analog audio and video products.

Contact Us

Contact Sierra Video Systems

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	Fax	530.478.1105
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	Sales Information	Sales@sierravideo.com
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